



Idea Proposal

Idea May (done)

Filing number: 004-10193 1/6

| | | |
|---------------------------|--------------------------------------|---------------------|
| Department head: Iwata | Section chief: Sato [round stamp] | Manager: Nakadai |
|---------------------------|--------------------------------------|---------------------|

Proposal date: October 30, 2001

Proposer's affiliation: NEC Yamagata, Product Development
Department, No. 5 Product Design (telephone extension: 2405)

Proposer:
Shinshi Endo (employee number: 0022219)
endo@pdd.ygnec.nec.co.jp E-mail address (yes ☒, no ☐)

[To be filled in by proposer]

Field of application: Display control device

Applicable product: Sales volume: (million yen/year)

State of experimentation and prototyping:

- ☐ Experimentation and prototyping completed
- ☐ Experimentation and prototyping underway
- ☒ Experimentation and prototyping planned
- ☐ Experimentation and prototyping not planned

Search for prior patents (Close patent publication number among those searched):

Unexamined patent 2001-092413
(method for doing gamma correction on input data,
different from the present invention.)

Search for prior references (close example of public knowledge among those searched):

Related proposals and patents:

Plans for announcement outside company: ☒ No ☐ Yes (Date: , Place:)

[To be filled in by supervisor]

Prospects for implementation:

- ☐ Decision for implementation
- ☐ There is a possibility (within two years)
- ☒ There is a possibility (within four years)
- ☐ Unclear
- ☐ No prospects (Reason:)

Desire for foreign application: ☐ No ☒ Yes (Countries: US, TW, KR)

Comments:

[Invention consultation comments] In charge: Takeshi Haga Date:

[To be filled in by evaluation committee]

Person responsible for evaluation: Riki Iwata

Decision date: October 30, 2001

Evaluation result:

(1.) Filing desired (☐ concurrent ☐ S class ☒ normal report)

2. Publication report

3. Withdrawal

4. Reevaluation

Foreign filing desired: ☐ No ☒ Yes

(Countries: US, Korea, Taiwan)

Comments: Will confirm examples of public knowledge once more.

If there are other ways of making corrections, will file as separate patents.

Request to center:

[Witness signature]

I have read and understood the content of the invention from page 1 to page 6 of this proposal (including drawings).

Name: Takeshi Sato

October 18, 2001

[Inventor signature]

Name: Shinshi Endo

October 18, 2001

Name:

, 2001

[Title of the invention]

Display control device

[Background and purpose of the invention]

A display control device for organic EL, in which RGB are each made self-light-emitting, requires gamma correction while matching the light-emitting properties of the organic EL for each of RGB, and gamma resistance is needed for the gamma correction for each of RGB.

In this case, three gamma resistances are needed inside the display control device, and the current consumed by the gamma resistances is three times that of a liquid crystal display control device that has one gamma resistance. And as external parts, it requires three times the power source for gamma resistance, which tends to increase the number of parts.

With the present invention, making these three gamma resistances into one reduces the current that is consumed by the gamma resistances and can minimize the power source for gamma resistance, so the purpose is to reduce the number of external parts.

[Gist of the claims]

The single gamma resistance is subdivided, and the subdivided electric potential can be selected independently by each of RGB.

Thus three gamma resistances can be made into one, the current consumed by the gamma resistance is reduced, and the number of external parts for the gamma resistance power source is reduced.

[Previous drawings]

Shown in Attachment 1.

[Previous composition and operation, manufacturing method and procedure, etc.]

A display control device for organic EL, in which RGB are each made self-light-emitting, requires gamma correction while matching the light-emitting properties of the organic EL for each of RGB, and what is needed is gamma resistance for the gamma correction for each of RGB, and an external power source for each gamma resistance.

The electric potential after gamma correction is connected to a DAC [digital-to-analog converter], and the output of the DAC is input into an OP AMP [operational amplifier] with each electric potential selected according to the value of a digital signal of the input data, while the output of the OP AMP is impressed on the organic EL.

The organic EL emit light of various brightness, depending on the value of the electric potential or current that is impressed on the organic EL.

[Main drawbacks heretofore]

Three gamma resistances are required inside a display control device, and the current consumed for gamma resistance is three times what is required with a liquid crystal display control device that has one gamma resistance.

Also, if the external voltage impressed on the three gamma resistances is different for each, then a power source is needed for gamma resistance for each external voltage value, and the number of external parts will be increased.

[Reason why the above drawbacks occur]

Because gamma correction is needed to match the light-emitting properties of each RGB of the organic EL.

[Drawings of the invention]
Shown in Attachment 2.

[Invention's composition and operation, manufacturing method and procedure, etc.]

The electric potential that is taken from a single gamma resistance is subdivided, and the subdivided electric potential is connected independently to a DAC for each of RGB by a selection circuit.

[Main effects of the invention]

- Low current consumption
- Can reduce the number of external parts.

[Reason why the above effects are obtained]

By making three gamma resistances into one, the electric current that is consumed by gamma resistance is reduced, and because a single power source for the gamma resistance suffices, the number of external parts is reduced.

[Features and novel points of the invention]

A single gamma resistance is subdivided, and using a selection circuit, this subdivided electric potential is connected independently to a DAC for each of RGB.

Previous drawings

Attachment 1

| | | |
|---|---|---|
| γ resistance for R External power source γ properties for R to DAC | γ resistance for G External power source γ properties for G to DAC | γ resistance for B External power source γ properties for B to DAC |
| Voltage External power source Input data | External power source | External power source |

Gamma correction is necessary to match the light-emitting properties of each of RGB, and what is needed are gamma resistance matching each of RGB, and an external power source for each gamma resistance.

Drawing of the invention

Attachment 2

γ resistance for RGB

External power source To DAC for R
Selection circuit To DAC for G
To DAC for B

External power source

γ properties for R γ properties for G γ properties for B

Voltage
Input data

| | |
|---|---|
| 1. What is the background that makes this proposal necessary? In particular, what are the true issues (the real problems)? | |
| Lower electric-current consumption for a display control device | |
| 2. Why has what this proposal offers been impossible until now? | |
| Because display control devices for organic EL that cause the self-emission of light for each of RGB are in the initial stages of development. | |
| 3. Why has what was heretofore been impossible become possible this time? | |
| Because a single gamma resistance is subdivided, and using a selection circuit, this subdivided electric potential is independently connected to a DAC for each of RGB. | |
| 4. What are the anticipated problems (side effects)? | 5. How will the anticipated problems (side effects) be addressed? |
| It is thought that the layout area of the selection circuit that connects the subdivided electric potential to the DAC will be large. | Dealt with by fine processing. |
| 6. If you have any other <u>constructive</u> proposal for this proposal system, please list it. | |
| None in particular. | |

This is what was often asked about in the evaluation committee. If these matters are properly noted, preparation of a description of the invention can go smoothly, so please submit this together with the idea proposal.